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目次 CONTENTS

報告 Transactions

26. Tsuneteru OINOMIKADO, Molluscan Fossils from the Pleistocene Deposit of Sisinai in Tôbetu-mura Isikari-gun, Hokkaidô (Published January 20) ········· 1
北海道石狩郡當別村獅子内産洪積世貝化石 (摘要) (1 月 20 日發表) ········· 大炊御門經輝 6
27. Kotora HATAI, A Short Note on the Punctation of the Brachiopod Shell (Published February 20) ········· 7
腕足類殼の Punctation に就きて (摘要) (2 月 20 日發表) 畑井小虎 10
28. Tokio SHIKAMA, Pathologic Examples of Fossil Deer Bone and Antler from the Fissure Deposits of Kuzuu (Published February 20) ········· 12
葛生裂罅堆積物産化石鹿の骨及び角の疾病例 (摘要) (2 月 20 日發表) ········· 鹿間時夫 14
29. Kotora M. HATAI, Brachiopod Morphology: Studies on the Anterior and Lateral Commissures of Certain Forms and the Curvature of the Beak, their Relationship and Morphological Importance (Published March 20) ········· 17
腕足類形態學: 或る形の前部並に側部接合及び嘴の屈曲, 此等の相互關係及び形態學的重要性に就いての研究 (摘要) (3 月 20 日發表)··畑井小虎 26
30. Yaichiro OKADA, A Fossil Frog from Japan (Published March 20) ········· 27
日本産蛙の化石 (摘要) (3 月 20 日發表) ·········岡田彌一郎 29
31. タイプの問題········· 槇山次郎 30
Jirô MAKIYAMA Discussion of Type (Rèsumè) (Published March 20) 32
32. Hisakatsu YABE and Toshio SUGIYAMA, Sundry Notes on Living and Fossil *Tubipora* (Published March 20) ········· 33
現棲及び化石 Tubipora に就いて (摘要) (3 月 20 日發表) ········· 矢部長克, 杉山敏郎 38

紀事 Proceedings ········· 15

日本古生物學會報告

(Transactions of the Palaeontological Society of Japan)

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26. *Molluscan Fossils from the Pleistocene Deposit of Sisinai in Tôbetu-mura Isikari-gun, Hokkaidô.*

By

Tsuneteru OINOMIKADO.

(Received Oct. 30th.; read Nov. 21st, 1936)

In the summer of 1936, I have made a large collection of fossil shells from the Pleistocene deposit of Sisinai (about 20 km NNE of Sapporo). Cross-bedded brown sand containing numerous fossil is exposed on a cliff near Sisinai, and the Sisinai fauna comprises Mollusca, Foraminifera, Ciripedia, Brachiopoda and Bryozoa, and among them Mollusca and Foraminifera are dominant. Recently Prof. NAGAO[1] reported the Pleistocene fossiliferous deposits in Hokkaidô and mentioned 39 species of Molluscan fossil of Sisinai. The distinguishable species in my collection is attained to 71 in total, of which 36 belong to Pelecypoda, 34 to Gastropoda and 1 to Brachiopoda. Among the 70 species of Mollusca, 54 have been specifically identified, while 16 remain undetermined. The latter include mostly very small forms and most of them are probably new to science.

The fossil shells of Sisinai are as follows:

Pelecypoda

1. *Nucula (Acila) insignis* GOULD	Common
2. *Arca boucardi* JOUSSEAME	Common
3. *Glycymeris yessoensis* (SOWERBY)	Abundant
4. *Crenella yokoyamai* NOMURA	Abundant

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[1] NAGAO: Post-Setana Fossiliferous Beds in Hokkaidô, Jour. Geol. Soc. Tokyo, Vol. 41, No. 487, pp. 205-207, 1934.

5.	*Mytillus grayanus* DUNKER	Abundant
6.	*Chlamys* (*Chlamys*) *swiftii* (BERNARDI)	Rare
7.	*Chlamys* (*Chlamys*) *farreri akazara* KURODA	Rare
8.	*Pecten* (*Patinopecten*) *yessoensis* JAY	Abundant
9.	*Limatula subauriculata* (MONTAGU)	Common
10.	*Cardita* (*Miodontiscus*) *prolongata* (CARPENTER) (=*Venericardia nakamurai* YOKOYAMA)	Rare
11.	*Venericardia* (*Cyclocardia*) *ferruginea* (A. ADAMS) CLESSIN	Common
12.	*Corbicula* sp. (Immature of *C. nipponensis?*)	Rare
13.	*Diplodonta* (*Felaniella*) *usta* (GOULD)	Common
14.	*Codakia* (*Pillucina*) *pisidium* (DUNKER)	Rare
15.	*Mysella oblongata* (YOKOYAMA)	Common
16.	*Mysella japonica* (YOKOYAMA)	Common
17.	*Cardium* (*Cerastoderma*) *californiense* DESHAYES	Rare
18.	*Callista brevisiphonata* (CARPENTER)	Rare
19.	*Saxidomus purpuratus* (SOWERBY)	Rare
20.	*Protothaca staminea* (CONRAD)	Rare
21.	*Venerupis* (*Amygdala*) *variegata* (SOWERBY)	Common
22.	*Mactra* sp. (Immature of *M. carneopicta?*)	Rare
23.	*Mactra* (*Mactromeris*) *polynyma voyi* (GABB)	Common
24.	*Sanguinolaria* (*Nuttallia*) *olivacea* (JAY)	Rare
25.	*Gari* (*Psammocola*) *californica* (CONRAD)	Rare
26.	*Macoma incongrua* (v. MARTENS)	Rare
27.	*Macoma nipponica* (TOKUNAGA)	Rare
28.	*Tellina* (*Fabulina?*) *nitidula* DUNKER	Rare
29.	*Tellina* (*Peronidia*) *salmonea* (CARPENTER)	Common
30.	*Aloidis venusta* (GOULD)	Rare
31.	*Hiatella orientalis* (YOKOYAMA)	Rare
32.	*Mya truncata* LINNÉ	Rare
33.	*Mya arenaria japonica* JAY	Rare
34.	*Cryptomya* sp.	Rare
35.	*Lyonsis* (*Entodesma*) *truncatissima* (PILSBRY)	Rare
36.	*Myadora fluctuosa* GOULD	Common

Gastropoda

37.	*Puncturella* (*Puncturella*) *nobilis* (A. ADAMS)	Rare
38.	*Patelloida schrenckii* (LISCHKE)	Common
39.	*Patelloida pygmaea* (DUNKER)	Common
40.	*Patelloida* sp.	Rare
41.	*Patelloida* (*Tectura*) *pallida* (GOULD)	Rare
42.	*Margarites* (*Lirularia*) *pygmaea* (YOKOYAMA)	Rare
43.	*Margarites* sp.	Common

44.	*Solariella* sp.	Common
45.	*Calliostoma multiliratum* (Sowerby)	Common
46.	*Ganesa* (*Leptogyra*) sp.	Rare
47.	*Homalopoma amussitata* (Gould)	Abundant
48.	*Lacuna inornata* (Yokoyama)	Common
49.	*Cingula* sp. No. 1.	Common
50.	*Cingula* sp. No. 2.	Rare
51.	*Alvania concinna* A. Adams (=*Rissoa sadoensis* Yokoyama)	Common
52.	*Alvania maya* (Yokoyama)	Common
53.	*Caecum* sp.	Common
54.	*Cerithiopsis* sp.	Rare
55.	*Seila crassicincta* (Yokoyama)	Common
56.	*Triphora* sp.	Rare
57.	*Leucotina dianae* (A. Adams)	Rare
58.	*Menestho* (*Menestho*) *exaratissima* (Dall et Bartsch)	Rare
59.	*Menestho* (*Odetta*) sp.	Rare
60.	*Polinices* (*Lunatina*) *pallida* Broderip et Sowerby	Rare
61.	*Natica* (*Tectonatica*) *clausa* Broderip et Sowerby	Rare
62.	*Trophon* (*Boreotrophon*) sp.	Rare
63.	*Ocenebra* (*Ocinebrellus*) *adunca* (Sowerby)	Rare
64.	*Mitrella burchardi* (Dunker)	Abundant
65.	*Searlesia fuscolabiata* (Smith)	Rare
66.	*Nassarius* (*Tritonella*) *dominulus* (Tapparone-Canefri)	Rare
67.	*Haedropleura fukuchiana* (Yomoyama)	Rare
68.	*Cythara* (*Mangelia*) *deshayesii* (Dunker)	Rare
69.	*Ringicula* sp.	Rare
70.	*Retusa* sp.	Rare

Brachiopoda

71.	*Terebratalia coreanica* (Adams et Reeve)	Rare

Among the 39 species of Mollusca reported by Prof. Nagao, the 17 species are not represented in my collection and they are as follows: *Pseudogramatodon obliquata* (Yokoyama), *Anadara inflata* (Reeve), *Mytilus edulis* (Linné), *Ostrea gigas* Thunberg, *Ostrea rosacea* Deshayes, *Joanisiella cumingi* (Hanley), *Lucina acutilineata* (Conrad), *Cardium muticum* Reeve, *Callista pacifica* (Dillwyn), *Cyclina sinensis* (Gmelin), *Schizothaerus nuttalli* (Conrad), *Macoma tokyoensis* Makiyama, *Panope japonica* A. Adams, *Calliostoma shinagawensis* Tokunaga, *Natica janthostoma* Deshayes, *Neptunea arthritica* (Bermardi), *Nassarius japonicus* (A. Adams). The two species, *Calliostoma shinagawensis* Toku-

NAGA and *Nassarius japonicus* (A. ADAMS), should be identified as *Calliostoma multiliratum* (SOWERBY) and *Nassarius dominulus* (TAPPARONE-CANEFRI), both are represented in my collection. Hence all of the known species of the Sisinai fossil Mollusca up to the present time indicates 69 in number, viz. 54 of my identified forms together with 15 of NAGAO's collection.

Messrs. KINOSITA and ISAHAYA[1] have reported 109 species of the recent shells from Hokkaidô, of which the following species are found in the Sisinai fauna: *Arca boucardi* JOUSSEAME, *Glycymeris yessoensis* (SOWERBY), *Mytilus grayanus* DUNKER, *Mytilus edulis* LINNÉ, *Chlamys swiftii* (BERNARDI), *Chlamys akazara* KURODA, *Pecten yessoensis* JAY, *Ostrea gigas* THUNBERG, *Cardium californiense* DESHAYES, *Callista brevisiphonata* (CARPENTER), *Saxidomus purpuratus* (SOWERBY), *Venerupis variegata* (SOWERBY), *Mactra voyi* (GABB), *Sanguinolaria olevacea* (JAY), *Macoma incongrua* (v. MARTENS), *Tellina salmonea* (CARPENTER), *Hiatella orientalis* (YOKOYAMA), *Panope japqnica* A. ADAMS, *Mya japonica* JAY, *Patelloida pallida* (GOULD), *Homalopoma amussitata* (GOULD), *Natica janthostoma* DESHAYES, *Tritonalia adunca* (SOWERBY), *Mitrella burchardi* (DUNKER), *Neptunea arthritica* (BERNARDI), *Searlesia fuscolabiata* (SMITH), *Nassarius dominulus* (TAPPARONE-CANEFRI).

Dr. SASAKI[2] listed 87 living species of Pelecypoda found in Hokkaidô and Saghalin, and among them the following pelecypods are also known in the shell bed of Sisinai: *Nucula insignis* GOULD, *Pseudogramatodon obliquata* (YOKOYAMA), *Arca boucardi* JOUSSEAME, *Anadara inflata* (REEVE), *Glycymeris yessoensis* (SOWERBY), *Mytilus grayanus* DUNKER, *Chlamys swiftii* (BERNARDI), *Diplodonta usta* (GOULD), *Lucina acutilineata* (CONRAD), *Codakia pisidium* (DUNKER), *Cardium muticum* REEVE, *Venerupis variegata* (SOWERBY), *Mactra voyi* (GABB), *Schizothaerus nuttalli* (CONRAD), *Gari californica* (CONRAD), *Macoma nipponica* (TOKUNAGA), *Aloidis venusta* (GOULD), *Mya truncata* LINNÉ, *Mya japnica* JAY.

There are 31 species of mollusks, which were not reported by SASAKI, KINOSITA and ISAHAYA. But are indicated in my pre-

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1) KINOSITA and ISAHAYA: Catalogue of the Mollusca of Hokkaidô, Rep. Fish. Exp. Stat. Hokkaidô, No. 33, 1934.

2) SASAKI: A List of Lamellibranchs from Hokkaidô and Saghalin, Bull. Sch. Fish. Hokkaidô Imp. Univ., Vol. 3, 1933.

sent paper, and they are already known in northern Japan except the following 7 species: *Crenella yokoyamai* NOMURA, *Ostrea rosacea* DESHAYES, *Mysella oblongata* (YOKOYAMA), *Lacuna inornata* (YOKOYAMA), *Leucotina dianae* (A. ADAMS), *Haedropleura fukuchiana* (YOKOYAMA), *Cythara deshayesii* (DUNKER). Of the above mentioned species, *Mysella oblongata* YOKOYAMA and *Lacuna inornata* (YOKOYAMA) are not found in living state, and distribution of these 7 species in fossil and living state is as follows:

Crenella yokoyamai NOMURA
  Fossil: Pleistocene and Post-Pleistocene of Kwanto region.
  Living: Central Japan.

Ostrea (*Lopha*) *rosacea* DESHAYES
  Fossil: Miocene of Akita-ken and Hukusima-ken. Pliocene of Taiwan (Formosa). Pliocene, Pleistocene and Post-Peistocene of Kwanto region.
  Living: Central and Western Japan. China. Lord Hood's Island.

Mysella oblongata (YOKOYAMA)
  Fossil: Peistocene of Kwanto region and Noto Peninsula.

Lacuna inornata (YOKOYAMA)
  Fossil: Pliocene of Akita-ken.

Leucotina dianae (A. ADAMS)
  Fossil: Pliocene of Isikawa-ken and Niigata-ken.
  Living: Central and Western Japan.

Haedropleura fukuchiana (YOKOYAMA)
  Fossil: Pleistocene of Kwanto region.
  Living: Central Japan.

Cythara (*Mangelia*) *deshayesii* (DUNKER)
  Fossil: Pliocene of Akita-ken and Sado island. Pliocene, Pleistocene and Post-Pleistocene of Kwanto region.
  Living: Central and Western Japan.

The Sisinai fauna are mostly living in northern Japan, and a few species which are not found yet in this region are known among the Oyasio-type fossils of several localities. From the evidence obtained by the Sisinai fossil fauna, it seems to be reasonable to conclude that during the deposition of the shell bed, the

water temperature in Sisinai region wss approximately similar with that of the present time.

北海道石狩郡當別村獅子內產洪積世貝化石（摘要）

大炊御門 經輝

嘗て長尾教授に依つて報告せられた北海道石狩郡當別村獅子內の貝化石に就いて述べてある。

採集数71種, 內斧足類36, 腹足類34, 腕足類1。斧足類及び腹足類70種の中同定し得たものは54種で, 他の16種は微小な貝で恐らく新種と思はれるものも含まれてゐるが, 是等に就いては目下調査中であるから將來更に報告することにしたい。

長尾教授の報告せられたものと合すると獅子內の貝化石は69種になり, その大部分は現在北日本に棲息してゐる。從つて本貝層の堆積當時の水溫は今日の北海道のそれと大差なかつたと思はれる。

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27. A Short Note on the Punctation of the Brachiopod Shell.

By

Kotora HATAI

(Contribution from the Institute of Geology and Palaeontology, Tôhoku
Imperial University, Sendai, Japan. Read Nov. 21st.;
received Nov. 25th.; 1936.)

It is well known that in many species of both recent and fossil brachiopoda, the shell is traversed by more or less vertical canals or tubules which expand upward and are said to terminate in the lamellar layer, not piercing the periostracum. These pores are usually simple (non-branching type) but in certain forms they divide into several branches of antler-like fashion (branching type). In the non-branching type, the pores, although variable in size, take the same or similar shape.

The function of these pores have been attributed to different phenomena by different authors, one school considers them to be sense-organs, another regards them as food-canals, the third believes them to be water passages, and the fourth school places them as respiratory organs. As far as I am aware, nothing definite has yet been published in this regard, probably due to the difficulty of securing specimens for study on the one hand and the greater weight being laid on the study of fossil material by paleontologists and to the study of anatomy, ecology or other biological sciences on the other. I am in the belief that the pores either aid in respiration of the animal or are related in a similar way.

Punctations of the brachiopod shell, such as fine and dense, coarse and distinct, have been employed by some authors for specific distinctions, and is said to possibly even indicate genetic series.

McCoy[1] described a new species, *Waldhemia macropora* (synonym of *Magellania imbricata* Tenison-Woods), from the Tertiary of Victoria, distinguishing it from *Magellania flavescens* (Lamarck), a recent species of southeast Australia, by its coarser punctation; possessing about 18–19 pores in the space of one line as against 27–28 in *M. flavescens* (formerly placed in the genus *Waldhemia*). Buckman[2] evidently considers it probable that differences in punctations in terebratulids from the Oligocene-Miocene beds of Cockburn Island, Antarctica might indicate genetic series. He states that "there are two series which differ conspicuously in the character of their tests. The first series shows coarser and distinct punctae associated with a rather thick test. The second series shows a fine densely punctate test which is also thin."

Percival made studies on two English fossils, *Terebratula biplicata* and *T. punctata*. From his studies he concluded that the range of pore density is so great in different individuals that this feature can have little value for specific discrimination. Whether or not this may be the same for the species belonging to other genera, cannot be judged by his studies alone.

Leidhold (after Thomson[3]), "has found that the pore diameters and pore-density are sufficiently constant in fossil Orthids to be used for specific discriminations, and recognizes two types—one in which the pores are all of the same size, and another in which they vary in diameter in the same individual, in general being divisible into two series of larger and smaller pores."

In the rich collection of recent and Tertiary brachiopods now before me the punctations of some species have been studied. From the present studies, which is but a preliminary one, various

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1) McCoy, F., Geol. Surv., Victoria, dec. 6, p. 11, pl. 34, figs. 4, 6, 1877.

2) Buckman, S. S., Antarctic Foss. Brach., Wissensch. Ergebn. Schwed. Südpolar Exped. 1901–1903, Bd. 3, Leif. 7, 1910.

3) Percival, F. G., Geol. Mag., dec. 6, Vol. 3, pp. 51–56, 1916.

4) Thomson, J. A., Brach. Morph. a. Gen., p. 105, 1927.

types have been noticed, they are, branching and non-branching among the punctate forms, and non-punctate among the rhynchonellid brachiopods.

Among the species having an impunctate shell, the following are worthy of mention, namely;

Hemithyris psittacea (Gmelin)	Recent and fossil
H. braunsi Hayasaka	Fossil
H. pellucida Yabe and Hatai	Recent
H. peculiaris Nomura and Hatai	Fossil
Neohemithyris lucida (Gould)	Recent and fossil
Tegulorhynchia döderleini (Davidson)	Recent

Of the above mentioned forms, *Tegulorhynchia döderleini* has a characteristic prismatic structure of shell, that of *Hemithyris pellucida* is somewhat capillary, while *Hemithyris psittacea* shows also a prismatic structure.

Among the forms belonging to the punctate group, two types of punctae are recognized, namely, branching and non-branching. The branching punctae are found in forms possessing radial striae and those of the non-branching types in those without radial striae. The characteristic species of the branching type are;

Terebratulina retusa (Linnaeus)	Recent and fossil
T. japonica (Sowerby)	Recent and fossil
T. pacifica Yabe and Hatai	Recent
T. kiiensis Dall and Pilsbry	Recent and fossil
Terebratalia gouldii (Dall)	Recent and fossil
Coptothyris grayi (Davidson)	Recent and fossil

The branching pattern is most clearly seen in the valleys between the radial ribs; from the bottom of the valley they extend outwardly to the radial ribs on their sides. There are also other species belonging here, but they will not be enumerated at this place. Among those belonging to the non-branching type, the following are worthy of mention;

Gryphus stearnsi Dall and Pilsbry	Recent and fossil
Terebratalia coreanica (Adams and Reeve)	Recent and fossil
Laqueus rubellus (Sowerby)	Recent and fossil
Nipponithyris nipponensis Yabe and Hatai	Recent and fossil

In the case of *Nipponithyris nipponensis*, the branching pattern is found at the median septum, but not elsewhere, thus it was placed in the above group. Probably all of the species of *Gryphus*, *Laqueus*, *Pictothyris* and other genera provided with smooth sculpture belong here. There are a large number of species and genera belonging to the group with non-branching punctations, but they will not be enumerated here.

Studies on the punctations of the forms in our possession show that Buckman and McCoy were quite right in their statements, and that Percival, although correct for his species, cannot be applied to our species as a general rule. For example, *Japanithyris mariae* (A. Adams) can easily be distinguished from *J. nipponensis* Yabe and Hatai, by means of the punctation alone, one being fine and dense and the other being coarse and not dense. Therefore, the chances for differentiating species by means of the shell punctation is rather good, but whether this statement may hold good for other species or not is yet to be settled. However, should my assumption prove correct, then it follows that, fragmentary specimens may be generically or specifically determined in fossil state by means of the punctations-method. I feel the necessity for this study and hope to carry on further studies in the future.

At this place I should like to record my sincere thanks to Prof. H. Yabe, under whose direction I am now studying the recent and fossil brachiopod fauna of Japan, for the kind advices and supervision given me throughout the course of study.

腕足類殼のPunctationに就きて（摘要）

畑井小虎

現生並に化石腕足類の殼が多少canals又はtubesにより横貫され，更に上方に擴がつて表皮層(Periostracum)を通ぜずにlamellar layerにて止まると言はれる。之等の孔は種々の型に分類される。大別すれば單純型と分岐型とである。

之等の孔は，學者により感覺器，食道管，水管及び呼吸器であると言はれて居るが未だ其の機能は決定されない。然し筆者は*Terebratalia coreanica*に於ける自身の觀察並に函館

高等水産學校の田村正助教授の實驗より呼吸器であると信ずる。

Punctation は或著者は種の識別に役立つものとし，又 genetic series を示すものであると說ける學者もある。詳細は後日發表の豫定であるが此所に著しいものゝ一部を擧げて見るに，1) impunctate の殼を有するものは Rhynchonellidae のものに多く，prismatic 及び capillary structure が良く觀察される。2) punctate の型は 2 型が容易に決定され radial ribs を有する殼は一般に分岐型で，有しないものは單純型である。

筆者は是による分類をより一層精密に行へば此の孔のみで屬並に種を決定し得る可能性あるものと思ふ。

28. Pathologic Examples of Fossil Deer Bone and Antler from the Fissure Deposits of Kuzuu.

By

Tokio SHIKAMA.

(Contribution from the Institute of Geology and Palaeontology,
Tôhoku Imperial University, Sendai, Japan. Read Nov.
21 st.; received Nov. 25 th.; 1936.)

Deer remains of different species from the limestone fissure deposits of Kuzuu, Simotuke province, are very important as materials for studying the Pleistocene deer history of Japan. Among a great number of limb bones, ribs, vertebrates, teeth, skulls and antlers of deers collected by the writer from the locality there were found two fragmental remains of anomalous growth, a left metatarsus (proximal part) and a right antler (basal part), both probably of *Cervus* (*Depéretia*) *praenipponicus* SHIKAMA, which is a very peculiar, rather primitive deer of the Japanese Pleistocene.

The anomalous metatarsus has a distinct hyperostosis of spongy substance especially on the aft side; it is tuberculous and lamellar posteriorly, porous anteriorly and smooth laterally. The median aft groove of the cannon bone has vanished due to hyperostosis. On the inner-lateral side is a bordered hallow penetrating the aft-wall of the bone, and the marrow cavity is blocked by pathologic osteogenesis above the hollow. The hyperostosis outside the bone wall may be due to osteoma, while the hollow to tumors of bone marrow. This example is well allied to the case of a cannon bone of deer reported by O. ABEL[1] from the Pleistocene of Hundsheim, Austria. As the writer could ascertain the accumulation of deer remains in the limestone fissure of Kuzuu to be due to some natural agencies, such as rainfall, hillwash, landslide or certain others, the anomalous bone now at hand can not be considered as a case of cave-arthritis, as seen in certain examples of cave bear from the Drachenhöle near Mixnits reported by O. Abel and R. Breuer.

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[1] O. ABEL (1936), Vorzeitlichen Lebensspuren, p. 559.

The anomalous antler is of an adult animal; its dimensions (in mm.) are given below in comparison with those of a normal one (the paratype of *praenipponicus*);

	anomalous		normal	
	fore-&-aft	side-to-side	fore-&-aft	side-to-side
Circumference of burr	35.0	33.5	39.5	37.5
Ditto under first tine	27.0	17.0	45.0	26.0
Ditto above first tine	13.0	17.5	25.0	26.0
Distance between burr and bifurcation	92.0		89.5	

It is much smaller and poorly constructed; the beam above the bifurcation is abruptly slender and undulated antero-posteriorly. The first tine is very small. A callus at the outer-posterior side of the point of bifurcation may have probably been produced either by a break of beam just above it or in reaction to stimulus received in polishing antlers. The beam under bifurcation is bent outwards in an angle of about 20° with the pedestal and the part above the point of bifurcation reversely or inwards in an angle of about 25° to that under it.

In general, stunted or imperfect antlers of deer are due to the insufficient osteogenesis of anomalous animals detrimented in their reproductive organs or having weakened metabolism owing to deficient feeding or movement of bodies. Dr. Y. Abe[1] reported a tineless antler of an adult deer from Mt. Siraki, Mita-village, Takada-district, Aki province, and stunted antlers of deer from Miyazima of Seto-Uti resulted from poor metabolism characteristic to the isolated life in such a small islet. Accordingly the fossil antler now at hand may perhaps be an analogous example of the past.

The obliquity of beam to pedicle is a feature frequent in the Pliocene deer belonging to *Anoglochis* and allies, as *Cervus* (*Anoglochis*) *ardeus* Croizet and Jobert, *C.* (*A.*?) *kazusensis* Matsumoto and *C.* (*Depéretia*) *kokubuni* Shikama, but rather rare in *C.* (*D.*) *praenipponicus* Shikama; hence it is very likely that this feature is a primitive character of them, and its appearance in the anomalous antler now at hand may be interpreted as an atavism.

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[1] Y. Abe (1936), Zool. Mag., Vol, 48, No. 4, pp. 177–178.

Finally the writer wishes to record his warmest thanks to Prof. H. YABE and Mr. K. HATAI for their kind assistance given during the course of the study and also for correcting the present note before publication.

葛生裂罅堆積物産化石鹿の骨及び角の疾病例 （摘要）

鹿間時夫

下野葛生の裂罅堆積物より産した,多分ニツポンムカシジカに屬する左蹠前骨上部と右成體角の基部を掲ぐ。蹠前骨は海綿組織に於ける骨腫性の增骨と骨髓內部の腫瘍（病因不明）性病竈及び髓腔隔壁の壞死を生ず。墺國洪積統産鹿蹠前骨の病骨に類似す。角は痩型にて屈曲し，分叉部に假骨を生ず。幼期に於る生殖腺機能障害，營養不良，運動不足等の新陳代謝不全による造骨作用の不完全に起因する病的畸形及び或は骨折部の假骨形成にて,阿部余四男氏の廣島地方より報ぜられたる現棲日本鹿の畸形と似たるものならん。座骨に對し骨幹の傾く現象は,ムカシ鹿及びアルデ鹿屬に於ける原始的形質の如し。本報は本邦最初の病骨化石の記錄なり。

Explanation of Plate 2 (1)

Cervus (Depéretia) praenipponicus SHIKAMA.

Fig. 1. A normal adult left metatarsus; aft side cited for comparison. ×0.5

Fig. 2. An anomalous left metatarsus; inner side of proximal portion ×.1.

Fig. 3. Ditto. Aft side of proximal portion. ×1

Fig. 4. Basal portion of an anomalous right antler with pedestal. ×0.5

Jour. Geol. Soc. Japan, Vol. XLIV, Pl. 2 (1) (SHIKAMA)

Fig. 1

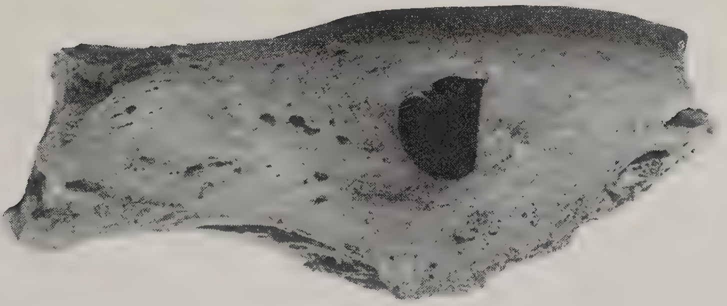

Fig. 2

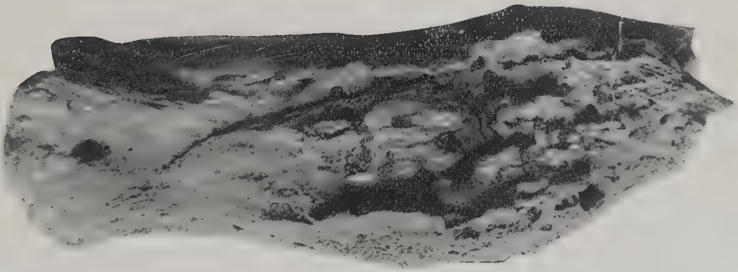

Fig. 3

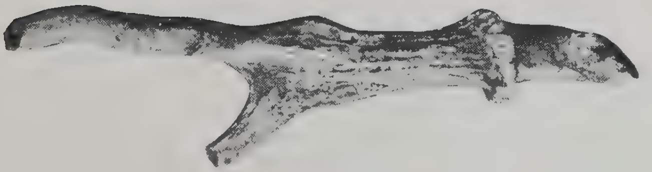

Fig. 4

日本古生物學會記事

昭和 11 年 9 月 26 日　日本古生物學會第 4 回例回を東京帝國大學理學部地質學教室に於て開催す。講演者並に講演題目次の如し。

土佐灣現生有孔蟲類と土佐國安藝郡海岸に發達せる鮮新期層化石有孔蟲類との比較考察	淺野清
日本產 *Robulus costatus* (FICHTEL and MOLL) 及び其亞種に就いて	淺野清
An Occurrence of *Receptaculites* from the Ordovician of Northwestern Corea.	Nobuo IKEBE
A Brief Note on the Genus *Echinarachnius*.	Syôzô NISIYAMA
Calliostoma shinagawaensis TOKUNAGA and Its Allied Species from the Pleistocene of South Kwanto.	Nobuo IKEBE
An Abnormal Form of *Umbonium moniliferum* (LAMARCK) from the Pleistocene of Sisui, Tiba Prefecture.	Kôiti SUZUKI
Fossil Mollusca from the Seki Beds of Mituisi-yama, Tiba Prefecture. (Studies on the Fossil Mollusca of the Bôsô Peninsula. No. 3.)	Kôiti SUZUKI
Quaternary Non-Marine Gastropods from Tsing-sing and Shih-chia-chuang in North China.	Kôiti SUZUKI
內蒙古產ヒラマキミヅマイマイ *Gyraulus* の 1 種, 特に其變異に就いて	鈴木好一
日本產 *Turritella* 屬に就いて	大塚彌之助
The Geologic Significance of the Recent Mollusca from the Vicinity of Isinomaki, Rikuzen.	Sitihei NOMURA and Kotora HATAI
On the Brackish and Fresh-Water Shells of the Tetori Series.	Teiichi KOBAYASHI and Kôiti SUZUKI
Restudy on the FRECH's Type Specimens of *Actinoceras richthofeni*.	Teiichi KOBAYASHI
Apical End of the Ordovician Cephalopod and its Bearing on the Classification.	Teiichi KOBAYASHI
Restudy on the DAMES' Type Specimens of Cambrian Trilobites from South Manchuria.	Teiichi KOBAYASHI
Cambrian Faunas of the Bunkei and Tanyo Areas, South Chosen.	Teiichi KOBAYASHI
Notes on the Nomenclature of the Cambro-Ordovician Fossils.	Teiichi KOBAYASHI
Fossil Elephants from Tiba Prefecture, Japan.	Fuyuji TAKAI
磐城より發見の *Desmostylus*	德永重康
地質時代の樹木の材質に就いて	島倉巳三郎
On the Epidermis of *Ilex miyagiensis* sp. nov. from the Lower Lignite Bed near Sendai.	Misaburô SHIMAKURA and Haruo OKUTSU
高坊山植物中の二三の *Sphenophyllum* に就いて	小島信夫

11 月 21 日　第 5 回例會を北海道帝國大學理學部地質學鑛物學教室に於て開催す。講演者並に講演題目次の如し。

Rotalidium, a New Genus of Foraminifera from the Pacific.	Kiyosi ASANO

On the Japanese Species of *Cassidulina*.	Kiyosi ASANO and Masayosi NAKAMURA
Brachiopod Morphology; Studies on the Anterior and Lateral Commissures of Certain Forms and the Curvature of the Beak, their Relationship and Morphological Importance.	Kotora HATAI
A Short Note on the Punctation of the Brachiopod Shell.	Kotora HATAI
On Some Terrestrial Gastropods from KUZUU, Totigi Prefecture.	Kôiti SUZUKI
Molluscan Fossils from the Pleistocene Deposit of Sisinai in Tôbetu-Mura, Isikari-Gun, Hokkaidô.	Tuneteru OINOMIKADO
Cardium (*Nemocardium*) *iwakiense* Makiyama の地質的並びに地理的分布に就て	竹田秀藏
幌内層の海棲貝化石に就て	竹田秀藏
釧路統と其の貝化石群に就いて	佐々保雄
島根縣濱田町附近の介化石に就いて	大塚彌之助
On Some Middle Cretaceous Fossils from Hokkaidô. (Contributions to the Cretaceous Palaeontology of Japan, II.)	Taturô MATUMOTO
函淵砂岩層（邊富内層群）の動物化石群に就いて	長尾巧 大立目謙一郎 齋藤林次
Brief Summary of the Cambro-Ordovician Shelly Fauna of South America. Part I. Faunal Aspect and its Bearing on the Eo-Palaeozoic Palaeogeography. Part II. List of Non-Graptolite Faunas.	Teiichi KOBAYASHI
Desmostylus の形態及び生態に就いて	長尾巧
Pathologic Examples of Fossil Deer Bone and Antler from the Fissure Deposits of Kuzuu.	Tokio SIKAMA
琉球にて發見せる鹿化石の一種に就て	徳永重康
南樺太散江郡野頃產「マンモス」(*Elephas primigenius*) に就いて	佐々保雄
石狩統羊齒帶の羊齒類二三に就いて	大石三郎 山下一男
岡山縣成羽產植物化石の或るものに就いて	大石三郎 山下一男
Notes on the Bast of Mesozoic Conifers.	Misaburô SHIMAKURA

昭和 11 年 7 月 23 日以降同年末迄の入會々員氏名次の如し。

今井秀喜　大山桂　金井達郎
李岐山　李四光　張麗旭
福地成治　吉村一郎
Curt TEICHERT　Hans E. THALMANN.

29. *Brachiopod Morphology: Studies on the Anterior and Lateral Commissures of Certain Forms and the Curvature of the Beak, their Relationship and Morphological Importance.*

By

Kotora M. HATAI

(Contribution from the Institute of Geology and Palaeontology, Tôhoku Imperial University, Sendai, Japan. Read Nov. 21st.: received Dec. 25th. 1936)

Up to the present time studies on the morphology of the Brachiopoda is mainly due to the elaborate studies by J. A. THOMSON, W. J. JACKSON, F. BLOCHMANN and others. The morphological features to be discussed in short in this article are an extension of the work by the two former mentioned authorities. As my work is yet in progress, I have no wish to state the results which will come from the presently continued studies in morphological features of the Japanese recent and fossil Brachiopoda, however, I wish merely to briefly outline some of the points which I believe to be of considerable importance in discrimination of genera and species on the one hand and to show their relationship to each other on the other. This article will not cover up all previous literatures concerning the subject as it is merely preliminary to a more detailed study which will appear in the near future.

Classification of the fossil brachiopoda, unlike that of the recent ones in which the loop and other peculiarities are yet retained, is difficult owing to the fact that the interior features are generally inaccessible and when accessible, the loop is not preserved in most of the cases and never preserved in those with complicated loops as far as observed among Japanese specimens, systematic morphological descriptions are frequently quite impossible. However, as a means for neglecting the interior features which are generally inaccessible, it seems necessary to find the relationship existing between the interior peculiarities and the external morphological characteristics, in order to carry out a more or less satisfactory basis for their classification.

With such a view in mind, I have attempted to find the relationship existing between the folding of the valves, curvature of the lateral commissure and curvature of the beak towards the dorsal valve. As the next step, I wish to find the relationship existing between those features to the interior features; this study will be reported at a near date.

At this place I should like to express my sincere thanks to Prof. H. YABE of the Institute of Geology and Palaeontology, Tôhoku Imperial University, Sendai, Japan, not only for the permission to publish this incomplete article but also for the criticisms and suggestions given me during the course of the present study.

The figures in this article are reproduced from the work of J. A. THOMSON, and the more important literature in regard to the present article, are given in the bibliography annexed at the end.

Folding of the Valves

The types of folding in the Cenozoic Brachiopoda of Japan is not exceedingly great nor varied, but even at that there are several interesting kinds observed among the recent and fossil species. The types of folding of the anterior commissure and its relation to the curvature of the lateral commissure is here believed to prove a great help in identification and classification. The types of folding defined by THOMSON (1927, pp. 55–60) are closely followed and to make explanations clear, his figures of the types of folding of the anterior commissure are reproduced (Fig. 1.). His definitions are as follows;

Sulcate (2): a single sulcus in the dorsal valve, opposed by a fold in the ventral. Also known as *inverted* or *norella* stage

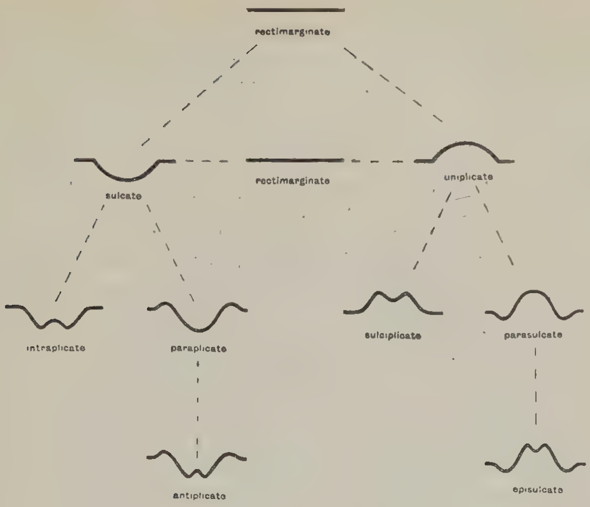

Fig. 1

in Rhynchonellids and the *centronella* stage in Terebratulids; ventrally uniplicate.

Intraplicate (5): a fold raised in the middle of the dorsal sulcus. Also known as ventral biplication and the prepygites stage.

Paraplicate (6): "folds are formed laterally of a dorsal sulcus which persists, giving rise to biplication from a sulcate stage." Also known as the holcothyrid stage.

Antiplicate (9): "the making of a dorsal fold in the sulcus of a paraplicate changing the type from biplicate to ventrally biplicate. Unknown in Recent and Tertiary genera."

Uniplicate (4): a single fold in the dorsal valve opposing a sulcus in the ventral valve. Also known as everted or rhynchonella stage in Rhynchonellids, and the lophrothyrid stage in Terebratulids.

Sulciplicate (7): "the raised fold of the uniplicate stage is broken down by median sulcation, and a fold is raised in the middle of the ventral sulcus-the reversed counterpart of intraplicate. Buckman terms this type of biplication the terebratula stage. It occurs in *Terebratula*, *Gryphus*, *Liothyrella*, and *Cancellothyris*."

Parasulcate (8): a sulcus formed on each side of the uniplica

-the reversed counterpart of paraplicate. "*Dallina* has ventral biplication which in its marginal contours has much the appearance of parasulcation, but nevertheless is probably due to intraplication."

Episulcate (10): a sulcus is imposed upon the median plica of a parasulcate form. A further modification of the parasulcate and the reversed counterpart of antiplicate.

Quadriplicate: Quadriplication may be produced by episulcation as just described, or by making folds after the paraplicate pattern on an already-formed parasulcate."

Multiplicate: "Alternate multiplication may arise by the repeated splitting (sulcation) of plicae in a folded shell, as in Eudesia, which passes through a uniplicate stage, while opposite multiplication may arise in a similar way from forms in the cincta stage."

The types of folding shown by the anterior commissure have been made a basis of generic distinction by DOUVILLE (1879), BUCKMAN (1907, 1918), and THOMSON (1915).

In the Japanese species of Brachiopoda the kinds of folding noticed are stated below. In *Hemithyris pellucida* YABE and HATAI, the anterior comissure or folding is rectimarginate, that is to say, the commissure is in a plane. In *H. psittacea* (GMELIN) and *H. braunsi* HAYASAKA, the anterior commissure is strongly folded uniplicate and in such cases the lateral comissure is strongly curved dorsally. In *H. psittacea* the folding or uniplication oftentimes shows a median sulcation in the raised fold of the plica, in this case the commissure becomes sulciplicate. In *H. braunsi*, the uniplication is generally squarely incised and not gently rounded. Although there is considerable change in the strength of the anterior and lateral commissures, very little change takes place in the shape of the beak. Therefore, it becomes evident that the folding of the anterior commissure is related to the curvature of the lateral commissure.

In the genus *Nipponithyris*, two types of folding are found, one is sulcate (*N. nipponensis* YABE and HATAI) and the other is rectimarginate (*N. subovata* HATAI). In the former, the degree of sulcation is not strong and concordant with this is the weak curvature of the lateral commissure; in the latter form, the rectimarginate commissure presents a truncated front margin with a straight lateral commissure. The latter form possess a very high beak which is nearly straight, while in the former the beak is short, truncated and about suberect.

The species belonging to the genus *Laqueus* are all found to possess a straight lateral commissure and a rectimarginate anterior fold, but sometimes there is truncation of the valves as in *L. quadratus* YABE and HATAI, or a tendency to bilobation as in *L. blanfordi* DUNKER, or a straight or weakly indented front margin as in *L. rubellus* (SOWERBY), well rounded as in *L. japonicus* YABE and HATAI, or a squarely rounded one as in *L. quadratus* YABE and HATAI. Even though the anterior margin shows such a wide range in its outline, the commissure is always rectimarginate and the lateral commissure straight. In such specimens the beak seems to be nearly the same for all, being fairly prominent, the beak ridges are sharp and the foramen permesothyrid and slightly remigrant. In the genus *Pictothyris*, the lateral commissure is the same as in that of *Laqueus* and the anterior one rectimarginate; in these points both genera are much similar to each other. However, in *Pictothyris* the foramen is attrite instead of remigrant.

The genus *Terebratalia* is represented by forms with a rectimarginate or sulcate anterior commissure and a straight or curved lateral commissure. The most characteristic species representing the sulcate folding is *T. coreanica* (ADAMS and REEVE), here the lateral commissure is strongly curved dorsally, and the weaker the sulcation becomes, the weaker is the lateral curve. A typical rectimarginate form is *T. sendaica* HATAI, *T. innaiensis* (HAYASAKA), or *T. tenuis* (HAYASAKA), in these forms both the anterior and lateral commissures are straight. A form with a flexuous anterior commissure is *T. gouldii* (DALL).

The anterior and lateral commissures of *Neohemithyris lucida* (GOULD) agree with *H. psittacea* except for staying within the limits of rounded-uniplicate, and, the lateral commissure attains a stronger curve.

The genus *Gryphus* represents three interesting forms, one, *G. tokionis* DALL, possess a rectimarginate anterior and a straight lateral commissure, the second, *G. hanzawai* YABE and HATAI shows a roundly and gently uniplication for the anterior and a weakly curved lateral commissure, the third, is *G. stearnsi* (DALL and PILSBRY), in this form the anterior is, in the adult stage sulciplicate and the lateral commissure is very strongly curved. *G. angularis* (HAYASAKA) belongs to a flexuous type, very near to *G. hanzawai* in its type of folding. *G. radiata* HATAI has a rectimarginate fold, and a straight lateral commissure.

In the forms of *Terebratulina* dealt with, the anterior commissure is represented by both rectimarginate and uniplicate forms with intermediate ones. The lateral commissure is either straight or curved according to the type of folding of the anterior commissure. A typically rectimarginate form is *T. kyusyuensis* YABE and HATAI or *T. photina* DALL; for the uniplicate forms, *T. retusa* (LINNAEUS) and *T. iduensis* HATAI are typical; and for forms with a very weak uniplication, *T. crossei* DAVIDSON is noteworthy. Even in some of the rectimarginate forms, the lateral commissure is found to be weakly curved, but becomes stronger with an increase in strength of anterior folding.

The strangulate stage, or when the anterior excavation, and a sulcus or depression in each valve, more or less confined to anterior portion of the valves are indicated, the cincta stage proper is indicated. Such a stage is found in *Laqueus blanfordi* DUNKER. The Cinta stage is known as the opposite stage and is subdivided into, Ligate stage, Strangulate stage, Bilobate stage, and Metacarinate stage, according to THOMSON (1927, p. 56).

From the data given above, it may be said that the lateral commissure remains straight as long as the anterior commissure or folding is rectimarginate. Further, in uniplicate forms the lateral commissure is generally curved in the ventral direction, in sulcate forms, the commissure generally curves dorsally, and, in rectimarginate forms a straight lateral commissure is common. *Neohemithyris lucida* represents the first form, *Terebratalia coreanica* the second, and, *Laqueus rebellus* the third. It should also be stated that in *Dallina*, where the anterior commissure is broadly sulcate to intraplicate, the lateral commissure is curved in the dorsal direction. The above mentioned statement holds good for all except those belonging to the genus *Terebratulina*.

The relation between the anterior folding of the valves and their lateral commissures seems to be much related to the ontogeny of the folding, and may be called parallel development.

This parallel development in the Cenozoic Brachiopoda of Japan appears to be valuable in discriminating the fossil specimens, especially when the curvature of the beak is brought into full consideration. Determination of the species is often possible by studying the parallel development and curvature of the beak.

Curvature of the Beak in some Brachiopods

The curvature of the ventral beak towards the dorsal valve is quite variable in certain species yet found to be fairly constant in others. The terminology of the curvature varies with the author, and here the terms proposed by Thomson (1927, p. 80) is followed, his figures are reproduced to make explanations clear. The curvature of the beak is an important feature for specific discrimination and it alone, in cases where the interior features are inaccessible, often becomes the deciding point.

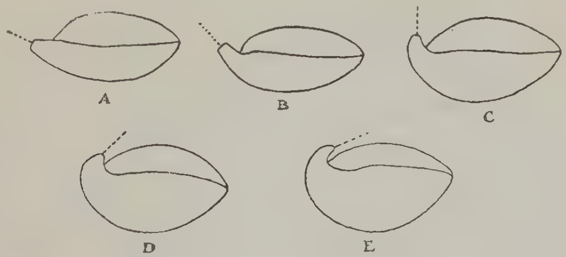

Fig. 2

In *Hemithyris* the beak is characteristically curved in rhynchonelliform manner, being quite erect, its length may be variable but its shape is generally constant. Also in *Pictothyris*, we find that in *P. hanzawai* the beak is always strongly incurved, a point by which it may easily be distinguished from *P. picta* (Dillwyn), the genotype of *Pictothyris*. Among the species of *Terebralia*, *T. innaiensis* is distinguishable from *T. gouldii* by usually having curved beak, from *T. sendaica* Hatai by the same feature, both are distinguishable from *T. gouldii* (Dall) by not having a truncated and worn beak. *T. coreanica* is most variable in this respect, and the curvature of the beak does not seem to play any important role in discrimination of species among the genus *Terebratalia*. Likewise in *Coptothyris*, the beak is too variable to be of importance.

The genus *Gryphus* possess such a characteristic beak, that it alone is sufficient in distinguishing it from the other genera known from Japan. The lower part of the beak (foraminal part) is characteristically curved in liplike fashion, the symphytium underlying the beak is always complete and concave to some extent. In the forms of this genus, the beak alone is the deciding factor in the inaccessability of the interior features as in fossil specimens. There are no other genera from Japan that possess such a beak as found in *Gryphus*. The genera *Dallina, Jolonica, Japanithyris* and *Campages* all resemble one another in the shape of the beak, and differentiation by means of the beak alone would bring about dangerous results in the present case. However, the size of the beak, shape of the symphytium and strength of the foramen are important. In *Laqueus* we find that the beak in all of the forms except *L. proprius* Yabe and Hatai, are constant. In the forms of *Terebratulina* the beak varies with age, i. e., in the adult form the beak becomes truncated (suberect), while in the young it is much higher. In adult stage, the beak alone may distinguish the genus *Terebratulina* from other genera, but in regard to species, its value is at present not considerable. The genus *Tanakura* is distinguishable from the other genera in Japan, by means of the shape of the beak only. *Nipponithyris* is also distinguished by the same manner, to this group may also be added *Surugathyris* and *Diestothyris.*

Curvature of the Lateral Commissure

Observations on numerous specimens of both recent and fossil material has led me in believing that the lateral commissure is morphologically more important than hitherto regarded. *Terebratalia gouldii* (Dall), and *Coptothyris grayi* (Davidson) including such forms as *C. aomoriensis* Hayasaka (a synonym of *C. grayi*) and *C. brevis* Hayasaka (also a synonym) and the typical *C. grayi* are indistinguishable from one another in many cases as they are merely ecological forms of each other, however, compared to *T. gouldii*, a form which is oftentimes indistinguishable from some of the forms of *C. grayi*, distinction may be found in the lateral commissure, that of *C. grayi* being indented while that of *T. gouldii* is not so.

Hemithyris psittacea (GMELIN) is distinguishable from its subspecies, *woodwardi* (A. ADAMS) by the lateral commissure; in the former species the commissure is more strongly curved even though it may have a weaker uniplication compared to that of the latter. *H. kyusyuensis* YABE and HATAI shows a straight or rectimarginate anterior fold and is thus distinguishable from *woodwardi* which has either a weakly uniplicate fold and a gently curved lateral commissure while *kyusyuensis* has a straight lateral commissure. *H. braunsi* HAYASAKA comes near to *psittacea* but is actually nearer to *woodwardi* in the strength of the lateral commissure.

Almost all of the species of *Laqueus* show a straight commissure, except for *L. japonicus* YABE and HATAI, which is in one case, ventrally curved and in other cases it is flexuous. However, it is to be regretted that *Pictothyris picta* (DILLWYN) cannot be distinguished from *L. rubellus* (SOWERBY) by means of the lateral commissure alone.

In the genus *Terebratulina*, it is found that its species have either a straight or a ventrally curved lateral commissure, it is never dorsally curved as in certain species of other genera. In one form, *T. crossei* DAVIDSON, it varies from nearly straight to ventrally curved. In *T. pacifica* YABE and HATAI the maximum curve is situated posteriorly, thereon anteriorly it is as nearly straight as can be detected by the eye. In this case the curve is very sharp and short in length. The subgenus *Surugathyris* has a straight lateral commissure, but is curved in the posterior region near the hinge-line, but the curve is so gentle that it is hardly noticed.

Terebratalia coreanica (ADAMS and REEVE) is characterized by being strongly curved in the dorsal direction; the curve is a large one and well defined. *T. sendaica* HATAI, *T. tenuis* (HAYASAKA), and *T. innaiensis* (HAYASKA) all possess a straight lateral commissure, but are distinguishable from each other by means of the shape of the beak.

The lateral commissure of *Dallina* is usually curved towards the dorsal valve. In *D. obessa* YABE and HATAI and *D. raphaelis* (DALL) this is soon noticed. The lateral commissure in *D. obessa* appears to be recurved, in *D. miyatokoense* HATAI it is weakly curved or nearly straight, and in some specimens of *D. raphaelis*, the lateral commissure is almost straight.

Although the lateral commissure shows variation in different individuals of the same species, there appears to be a tendency to curve in a defined direction according to species and genus. This tendency is in accordance with the curvature of the beak and folding of the valves. A threefold relation leads to important morphological features.

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腕足類形態學：或る形の前部並に側部接合及び嘴の屈曲，此等の相互關係及び形態學的重要性に就いての研究（摘要）

畑　井　小　虎

現在腕足類の分類に對して比較的に重要視されなかつた形態學的形質が實際には重要性を帶びて居ると思惟される。即ち殼の前部並に側部接合の形狀及び嘴の屈曲の性狀，並に此等の相互關係によつて屬並に種の識別される場合が寡くない。

研究は現在進行の途中にある故，其結果に就いては未だ論及し得ないが，2,3の重要性ありと思はれるもの及び其の例等に就いて記した。

30. A Fossil Frog from Japan.

By

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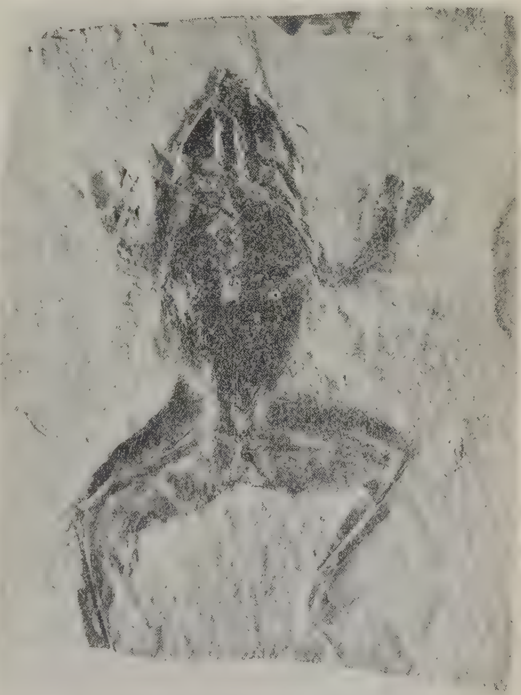
(Zoological Institute, Tokyo Higher Normal College.
Received Jan. 27th.; read Jan. 30 th.: 1937.)

In 1934 Prof. J. MAKIYAMA and Mr. Y. KIMIZUKA of the Geological Institute of Kyoto Imperial University reported the occurrence of the present specimen of fossil frog[1] Then they pointed out it belonging to *Rana*, but did not give any specific name. Since fossil-frogs are extremely rare, I reexamined the specimen through the courtesy of Dr. J. MAKIYAMA, who has kindly placed it at my disposal.

On the 12 th of August 1933, the present fossil was found when they were collecting fossil plants in a bed at an attitute of 1200 m. in Taruno-sawa, on the southern side of Kabuto-iwa, Minami saku county, Nagano Prefecture.



Text-fig. 1. *Rana architemporaria* about natural size.

The Kabuto-iwa is a part of the table land lying in the southern point of Arafune-volcano, which is known as one of the dissected volcanoes, lying between Shinano and Kozûke Provinces. In this district is developed the Pleistocene deposit composed of an alternation of thin tuffaceous shales and sandstones. The shale is grayish or light reddish brown in colour, and very thin, measuring 1 cm. at the thickest. The tuffaceous sandstone is grayish brown or light brown, and is variable in thickness, but seldom reaching 10 cm.

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[1] Chikyû, 1934, vol. 21, no. 5, pp. 5-8, pl. 5, textfig. 1.

Fossil bearing bed is about 8 m. thick and intruded by the pyroxene andesite. The rock at the contact part becomes hard and is apt to be easily broken into pieces. The layer remote from the lava is less inclined with a strike of N. 30° W. and a dip of NE 8°. The fossil bearing bed looks like the obsidian but careful observation reveals that fossil plants are present in it and its mother rock is an aqueous deposit.

The fossil frog specimen discovered in the shale and is secondarily flattened so that the breadth of body may be increased. The fragments of skeletons were left both on the upper and lower slabs. The muscular portion is of sepia color, while the eye and visceral portions are black. The cartilagenous part is faintly traceable.

This fossil specimen was compared with *Rana temporaria temporaria* L. and *Rana nigromaculata nigromaculata* H. of Japan. It is agrees with the recent species in the length of the body. However, in regard to its skeleton it resembles *Rana temporaria temporaria* rather than *Rana nigromaculata nigromaculata*. The distinct feature of the present specimen in comparison with the recent species is its shorter cranium and limbs, as will be seen in the following table. Therefore I wish to propose a new name of *Rana architemporaria* for the fossil frog.

	Fossil specimen	*Rana nigr. nigromaculata*	*Rana temp. temporaria*
From tip of head to anus	48 mm.	62 mm.	59 mm.
Breadth of cranium	20	24	24
Length of cranium	13	24	22
Breadth of frontoparietal	4	4.5	4
Length of frontoparietal	9	14	11
Length of brachium	13.5	14.8	20.5
Thickness of head of brachium	2.5	3	4
Length of antebrachium	9	9.2	13
Thickness of distal end of antebrachium	2.5	3	4
Total length of vertebrae	32	38	54
Length of urostyle	14	18	26
Length of vertebrae proper	18	20	28
Length of process of third vertebra	4	4	5
Length of femur	23	24.9	37

Thickness of head of femur	3	3.5	4
Thinnermost portion of femur	1	1.5	1.5
Length of tibia	24	25	35
Thickness of head of tibia	1.5	4	4.5
Breadth of acetabulum	4	4	4.5
Length of ilium	18	22	29

In writing the present paper I thank Dr. S. Tokunaga for his suggestions and criticisms.

日本産蛙の化石（摘要）

岡田彌一郎

昭和5年5月に發行された"地球"に，京都帝國大學槇山次郎博士及び君塚康治郎學士が，長野縣樽ノ澤の1200米の地點から採集された蛙の化石に就き發表された。その結論としては,該標本はアカガヘル屬 *Rana* に含まるるものであるが,種名が判然しないとの事であつた。筆者は同教授の御厚意により，その標本を拜見する事が出來たので,之れを現存する本邦に最も普通なるトノサマガヘル *Rana nigr. nigromaculata* H. 及びエゾアカガヘル *Rana temp. temporaria* L. 兩種の,本化石標本と略ぼ同體長のものの骨骼をとり相比較したるに，化石標本はトノサマガヘルよりエゾアカガヘルに,その骨骼標徵が似てゐることを知つた。然し該標本はほぼ同體長のエゾアカガヘルに比し，頭蓋骨の長さ及び幅が小で,且つ前後兩肢が著しく短いものである。依つて之れを新種とし *Rana architemporaria* と命名する。本研究を進むるに當り，文獻閲覧の便宜を與へられた,徳永重康博士に謝意を表する。

31. タイプの問題

槇山次郎

（昭和 12 年 1 月 28 日受理, 1 月 30 日講演）

タイプは分類の基準であり，分類のあらゆる段階の合法的な代表物をいふのである。Types の日本語に模式，基型などあるが動物學では模式を一般に用ひてゐる。しかしタイプと發音すれば英語式ではあるが Tipo に由來して世界共通の語であるから便宜上タイプを國語として使つてもよいと思ふ。type を語尾にする術語は 240 程もある。例へば屬のタイプを Genotype といふ。これだけのタイプの種類が實際上必要なわけではなくシノニムを省けば 30 位に整理することが出來る。なほ別にタイプの語尾を持ち生物學上に使はれる術語や印刷に關係した語がある。其中には分類學上のタイプとホモニムもある。門，綱，目等の大きな區分にタイプはさして重要でない。科は Type genus を基準にするがこれもさう窮屈に考へる必要がない。

タイプを嚴重に取り扱ふのは屬以下の分類の場合である。屬のタイプを學名法では Type species といふ。屬はこれにより定められ，その包容する範圍は見解により多少の異同をまぬかれない。屬の限界は定義により決めてはならない。屬の原著者の記載は屬を永久に固定するものではない。學名法では屬と亞屬とは同一條件で扱ふ。此故に genotype が subgenotype に變へねばならぬ樣なわづらはしい事がある。また genotype は遺傳學上では全く別の意味の語であり，古生物學上にもそれを多少擴大して用ひられてゐる。このホモニムの何れが先かに就いてオズボーンが論じた事もあるが，實際上 genotype といはずとも type で事足りるので分類學の方を廢用した方が良いと信ずる。

屬のタイプには學名法の定めた種類がある。即ち原著者の指定したもの，monotypy, tautonymy, ipso facto type, 後で指定したもの等である。此樣な種類に對し geno と type の間に適當な語を挾んだ名が提出してある。しかし

ながら其本質を確實に表現し盡してはゐないから，讀者は定義を記憶しなければ意味が少しも判らない有樣である。學問に術語が多いのは止むを得ないが無駄は出來るだけ節しなければならない。此故に私は genotype 及びこれに伴ふ apogenotype, genoholotype, genoplesiotype 等の語を排斥したい。廢棄すべき名稱は少くも 30 はある。

種のタイプは type specimen である。法律はタイプ標本を公の機關に保存するを命ずる。公開の博物館を最も適當とする。タイプの私藏は困つた問題である。種の同定にタイプは絕對な基準であるがこれに固執するは愚しい。誰か *Homo sapiens* のタイプを知つてゐるか。本來種はタイプに賴らずとも認め得べき本質のものでなければならない。本當のタイプは唯一でこれを holotype といふ。holotype 以外の原記載に使用した標本を paratypes とし，これが若干は他の研究機關に交換して差支へない。合瓣でない二枚貝の右片左片を cotypes とした場合もあるが，左右何れかを holotype とし他を paratype にするが正しい。allotype とは paratype であつて holotype と異性なものをいふが無用である。androtype は雄のタイプの事で不用である。chirotype は正しく發表され名のみの種のタイプである。これも無駄の一と思ふ。chorotype はタイプと同一の層準に出る化石標本をいひ，topotype はタイプと同産地の標本をいふ。この二は全然無用とは思へないが必要な名でもない。其他に主要な名稱をあげる：clastotype は holotype の破片，gynetype は雌のタイプ，ideotype は原産地以外の標本を原著者が同定したもの，morphotype は多形生物の holotype 以外の型を代表するもの，neanotype はさなぎのタイプ，nepiotype は幼蟲のタイプである。此等は何れも paratype であつて無駄な語である。homoeotype は確な人が同定した標本，hypotype はタイプを指定しなかつた著者の殘した記載及び圖に使用した標本で plesiotype と同じである。（後者はシノニムでもありホモニムでもあるので廢棄さる）。lectotype はタイプ指定なき場合後で定められるもの，neotype は失はれたタイプの代用物，plastotype はタイプの石膏等のモデル，syntype は cotype とシノニムである。以上はあつてもよい語であるが無くても間に合ふのである。

要するにタイプに關する術語はあまり餘計なものがありすぎ，また使用者は定義を段々に誤るから混雜を來すばかりである。害あつて益ない此等の語は思ひきり捨ててしまふを可とし，種のタイプに對しては holotype, paratype の二者のみを必要とし，唯 topotype, hypotype, lectotype, neotype は場合により使ふも可であるが專門家外の人の便宜上なるべくやめたいものである。

Discussion of Type (Rèsumè)

By

Jirô Makiyama

Types in taxonomy are coming up for discussion. There are at least 240 names of different sorts of types, without taking words in another side of biology and in printing into account. Of these some number being synonyms or homonyms will be given up. Statements or outlines of such special names of types have been changed frequently by later writers. To make simpler the words used in I. R. Z. N. are only offered and if needed a short account on the special quality of that type may be given. The simple word "type" will do enough in all cases, for example, it is clearly pointing type species when it is used respecting a genus. Holotype and paratype are the necessary words, while topotype, hypotype, lectotype and neotype may be used sometimes as well.

32. *Sundry Notes on Living and Fossil Tubipora.*[1]

By

Hisakatsu YABE and Toshio SUGIYAMA

(Contribution from the Institute of Geology and Palaeontology,
Tôhoku Imperial University, Sendai, Japan. Read and
received Jan. 30 th., 1937.)

(With two Plates)

In the collection of the reef-corals from the Japanese Seas and the South Sea, there are numerous specimens of the Alcyonarian genus *Tubipora*, their localities are;

1. Titi-zima (Reg. No. 44621)[2] and Haha-zima (Reg. No. 44620), both in the Ogasawara group.
2. Garanbi, the southernmost cape of Taiwan (Formosa) (Reg. Nos. 59330, 60647).
3. Fulalap in the Caroline group (Reg. No. 50796).
4. Yap (Reg. No. 41997) and Kazangl (Reg. No. 60650), both in the Palau group.
5. Ngulu (Reg. No. 53028), Kwajelin (Reg. No. 48792), Wotze (Reg. No. 48729), Jaluit (Reg. No. 49726), Likieb (Reg. No. 36993), all in the Marshall group.
6. Itu Aba in the Tizard Bank (Reg. No. 37271).
7. Batavia, Java (Reg. No. 37188).

Of the specimens of *Tubipora* some fifty in number now at our disposal, the largest one which is from Jaluit is almost as large as a man's head, while the others are 10-51 cm in diameter. One specimen from Garanbi forms a stock more or less flattened, whereas all others are dome-shaped. Among these materials are distinguished two types characterized as follows;

Type A: Corallites 1-1.8 mm broad, much crowded, 5 or 6 counted in 10 mm; mostly round but rarely octagonal in outline; walls 0.2 mm or slightly less thick. Platforms continuous, parallel, 4–6 mm distant.

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[1] Communicated in the January Meeting, Tokyo, 1937, under the title, "Two Forms of *Tubipora*".

[2] Register number of the specimen stored in the collection of the Institute of Geology and Palaeontology, Tôhoku Imperial University, Sendai, Japan.

Type B: Corallites 1.6–2.5 mm,[1] less crowded, 4 counted in 10 mm; usually with weak ringlets outside; walls usually thinner than in the type A. Platforms discontinuous, far apart and in unequal intervals.

A few of the spcimens belonging to the Type A are characterized in the possession of their tubes being octangular in outline, due to longitudinal sulci. In one specimen from Yap the sulcation is quite distinct in all tubes; the distinction of such a specimen from the usual ones with round tubes is so dicisive that we first took the former as representing an independent species. In certain other specimens, however, most of the tubes are nearly round as usual, while some of them are sulcated but slightly that this feature can be seen by proper application of light.

The Type A with round tubes is without doubt referable to *Tubipora musica* LINNÉ and the Type B to *Tubipora purpurea* LAMARCK on their respective characteristic features cited above. On the other hand, having no acquaintance of previous records about such a form with angular tubes, it will hereafter be distinguished as forma *sulcata* of *T. musica*. We have now specimens of *T. musica* from Ngulu (1), Fulalap (1), Kazangl (1), Batavia (1), and Garanbi (6); of forma *sulcata* from Yap (1), Wotze (4), and Garanbi (2); and of *T. purpurea* from Kwazelin (1), Jaluit (2), Itu Aba (6), Likieb (2), Titi-zima (6), Haha-zima (13), and Garanbi (1). Our present materials show that the two species are living in tropical and subtropical seas, while *T. purpurea* has its distribution extended further north than *T. musica*.

In the literature we consulted there are found only seven species bearing distinct names which are all living in the Indo-Pacific. Their diagnoses are:

> *Tubipora musica* LINNÉ:—Polypiérites étroits, n'ayant guère plus d'un millimètre de diamètre, très-rapprochés (environ 6 à 8 par centimètre) et parallèles entre aux. Planchers exothécales très-raproches[1].

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1) Occassionally a few of the tubes in one and the same stock are conspicuously broader than others, being at times, as broad as 3.6 mm.

Locality: Indian Ocean.

Tubipora purpurea LAMARCK:—Polypiérites beaucoup plus gros que ceux du *T. musica* (près de 2 millimètre en diamètre), tres-rapprochées, régulier et assex lisses, Planchers exothé cales nombreux.[2] Locality: Red Sea.

Tubipora fimbriata DANA:—(Disk of the polyps brownish-red, mouth yellow, tentalecs pale yellow, loosely fringed, papillae violet, in 2 or 3 series)[3]; tubes of the corallum scarcely 2/3 of a line thick, very much crowded and irregular, septa quite numerous.[4] Locality; Fiji Islands.

Tubipora syringa DANA:—(Polyps pale violet, papillae in contact and arranged neatly in an even plane)[3]; tubes of the corallum as in the *fimbriata*.[5] Locality: Fiji Islands.

Tubipora chamissonis EHRENBERG:—Polypiérites un peu plus large que dans les espèces précédentes, assez serrés. Pinnules des tentacules disposées en deux séries.[6] Localities: Radack Archipelago and East Indies.

Tubipora hemprichi EHRENBERG:—Polypiérites assez gros, plus espacés que dans les espèces précédentes; planchers exothécales éscartés: Polyps á tentacules bleuâtres ou verdâtres, a pinnules unisériées.[7] Locality: Red Sea.

Tubipora rubeola QUOY et GAIMARD:—*Tubipora*, tubis cylindricis, longis, laxis, rubris, sepimentis separates. (Polypis subrubris; tentaculis radiatis, pectinatis.)[3][8]. Localities: New Ireland and East Indies.

Tubipora musica with dicidedly narrower corallites and well developed, more crowded platforms can easily be distinguished from all of the others, which do not seem worthy of specific separation at least as far as the solid part only is concerned or for palaeontological purpose; we are quite in accordance with the view of

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[1] H. M. EDWARDS: Histoire naturelle de Coralliaires ou Polypes proprement dits, Vol. 1, p. 132, 1856.

[2] H. M. EDWARDS: loc. cit.

[3] Brackets are ours.

[4] J. D. DANA; Synopsis of the Reports on Zoophytes of the U. S. Exploring Expedition around the World, under C. WILKES, U. S. N. Commander, in the years 1838–1842, p. 128.

[5] J. D. DANA: loc. cit.

[6] H. M. EDWARDS: loc. cit., p. 133.

[7] H. M. EDWARDS: ibid.

[8] J. R. C. QUOY et J. P. GAIMARD: Voyage de découvertes de l'Astralabe exécute par Order du Roi, pendant les Annéés 1826–1829, sous le Commandent de M. J. D. d'URVILLE, p. 257.

T. W. VAUGHAN[1] who recognized only *T. musica* and *T. purpurea* as valid species. On the other hand, after careful examination of many hundred specimens collected from the Celebes, S. F. HICKSON[2] pointed out that the shape of the stocks, size of the tubes, distance of the platforms and the colour of the coral substance are all variable, so dependent upon the characters of environment in which the corals grow; thus he recognizes only one species under the name *T. musica.*

Tubipora is an inhabitant of the tropical and subtropical seas of the Indo-Pacific. R. TAYAMA and M. EGUCHI who have rich experience in the coral reefs of the South Sea Islands under Japanese Mandate, inform us that its usual habitat is in the outer slope of coral reefs where its stocks often attain 0.3 meters in diameter; living in other parts of the reefs, it grows to stocks commonly much smaller. The junior author found only small colonies (10–20 cm in diameter) in tranquil waters of Haha-zima and Titi-zima, Ogasawara group. At Garanbi, Taiwan, the condition is more favourable to its growth, E. EHARA obtained there somewhat larger stocks than those from the Ogasawara group. At present we do not known *Tubipora* living north of the latitude of Titi-zima in the North Pacific.

Previous records of *Tubipora* in fossil state is very rare and we are informed with only one instance, namely *T. rubeola* reported by J. FELIX[3] from the Pliocene of Timor. We have several specimens at our disposal which were collected by R. AOKI and S. HANZAWA of our Institute from the Ryûkyû limestone of the Ryûkyû Islands. These fossils are quite indistinguishable from the living examples of *T. purpurea* with corallites as broad as 25 mm, packed rather lax and provided with very discontinuous platforms at very irregular intervals.[1] The localities are:

1. Kikai-zima, Osima subgroup, Ryûkyû group. One specimen (Reg. No. 44375).

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[1] T. W. VAUGHAN: Some Shoal-water Corals from Murray Islands (Australia), Cocos-Keeling Islands and Fanning Islands, Dept. Mar., Biol. Carnegie Inst. Washington, Publ. IX, p. 206, 1918.

[2] S. J. HICKSON: An Introduction to the Study of Recent Corals, p. 112, 1924.

[3] J. FELIX: Jungtertiäre und Quartäre Anthozoen von Timor und Obi, Pal. v Timor, Lief. 8, p. 25, 1920.

2. Yonakuni-zima, Okinawa subgroup, Ryûkyû group. One specimen (Reg. No. 39963).
3. Miyako-zima, Sakisima subgroup, Ryûkyû group. Two specimens (Reg. No. 39346).

Explanation of Plate 3 (2)

(All figures are in natural size)

Tubipora purpurea LAMARCK

Loc. Titi-zima, Ogasawara Group (Reg. No. 44621)

Fig. 1. Upper view.
Fig. 2. Lateral view.

Tubipora musica LINNÉ

Loc. Garanbi, Taiwan (Reg. No. 59330)

Fig. 3. Upper view.
Fig. 4. Lateral view.

Tubipora musica LINNÉ

Loc. Batavia, Java (Reg. No. 37188)

Fig. 5. Lateral view.

Tubipora purpurea LAMARCK

Loc. Kikai-zima, Ryûkyû Islands (Reg. No. 44375); Ryûkyû limestone Fig. 6. Lateral view.

Tubipora purpurea LAMARCK

Loc. Yonakuni-zima, Ryûkyû Islands (Reg. No. 39963); Ryûkyû limestone

Fig. 7. Lateral view.

Explanation of Plate 4 (3)

Tubipora musica f. *sulcata* YABE et SUGIYAMA, nov. f.

Loc. Yap, Palau Group (Reg. No. 41997)

Fig. 1. Lateral view; × 7/8
Fig. 2. Upper view; × 7/8
Fig. 3. Lateral view of a corallite; × 9.

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1) Cited as *T. musica* in our previous papers, Reef Corals found in the Japanese Seas, Sci. Rep. Tôhoku Imp. Univ., Ser. 2 (Geol.), XV, 2, p. 168, 1932. Geological and Geographical Distribution of Reef-Corals in Japan, Jour. Pal., Menasha-IX, 3, pp. 191, 206, 1935. Revised Lists of the Reef Corals from the Japanese Seas and of the Fossil Reef Corals of the Raised Reefs and the Ryûkyû Lime, stone of Japan, Jour. Geol. Soc. Jap., Tokyo, XLII, 502, pp. 390, 401, 1935.

現棲及び化石 *Tubipora* に就いて （摘　要）

矢部長克・杉山敏郎

本邦沿岸及び南洋諸島產現棲標本及び琉球群島の琉球石灰岩產出化石標本合せて約 50 個に就いて調査した結果 *Tubipora musica* LINNÉ 及び *Tubipora purpurea* LAMARCK を區別することが必要となつた。前者は珊瑚管が細く，密集し且棚板が數多く密集し，尙その個々が廣く發達するのを特性とし，後者は反對に管太く，相互の距離遠く，棚板が不充分に且つまばらに發達してゐる。尙前者の 1 型として管の切斷面が八角形を呈するものがある。これを *Tubipora musica* forma *sulcata* と稱することにした。何れも熱帶亞熱帶の淺海に繁殖するもので，後種は前種よりも遙に北方まで其分布區域を延ばしてゐる。卽ち小笠原父島までも分布してゐる。

在來印度——太平洋より 7 種が區別されたが實際は上揭の 2 種に合せることが出來よう。HICKSON は全部同一種に包含すべきものだらうと言ふて居たが，化石を取扱ふ者には *musica* と *purpurea* の 2 種を區別することが必要の樣である。

Tubipora の化石は在來甚だ記錄に乏しい。FELIX がチモールの鮮新層から *T purpurea* (=*rubiola* QUOY et GAIMARD) を報告したことがある。本邦では琉球群島所々の琉球石灰岩から *T. purpurea* が發見された。著者等が今迄で *T. musica* の名で載錄したものが卽ちそれである。

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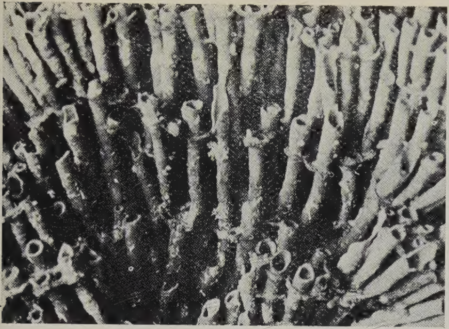
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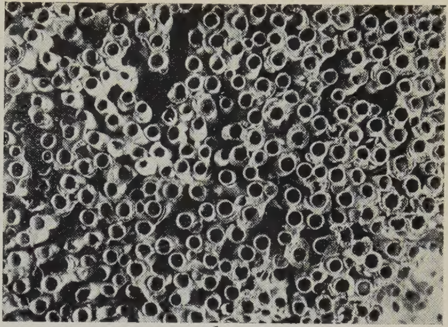
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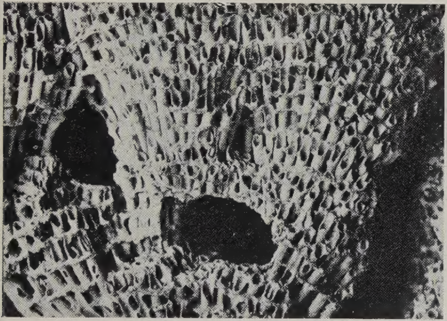
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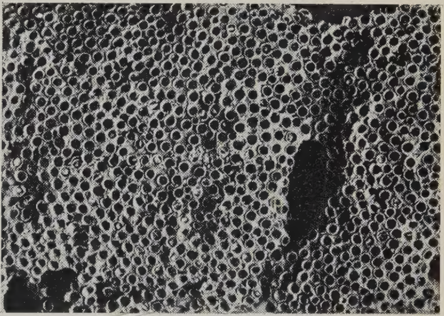
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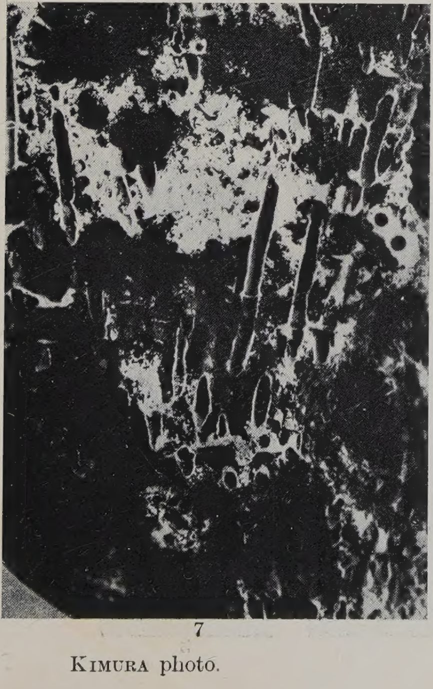
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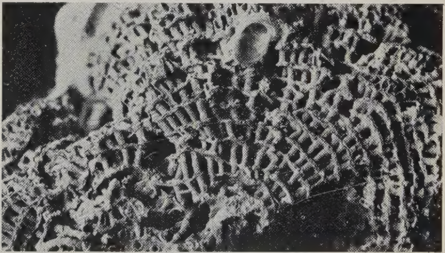
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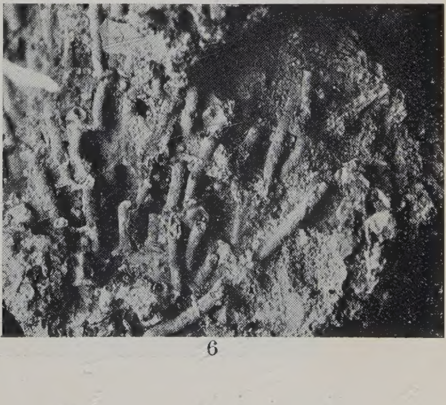
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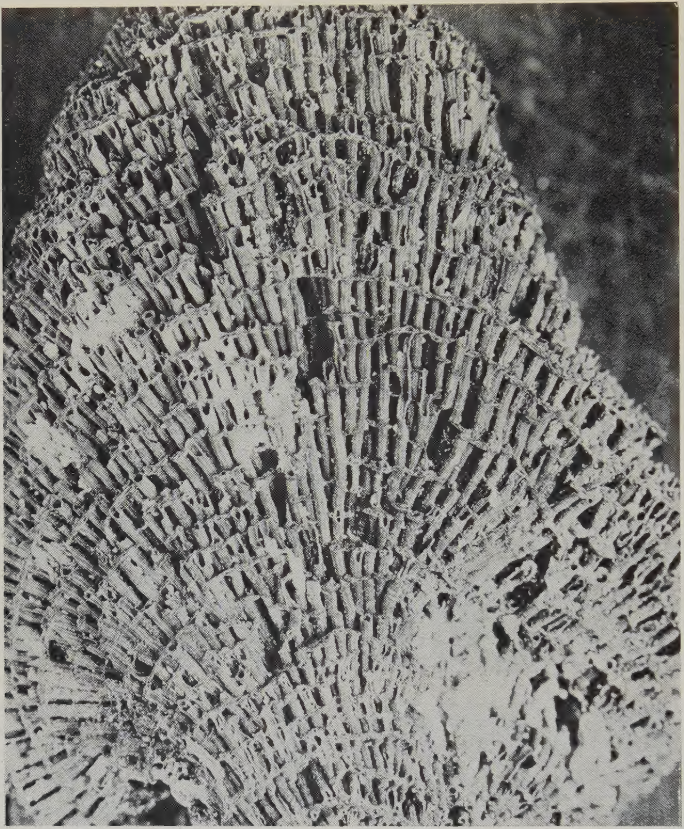

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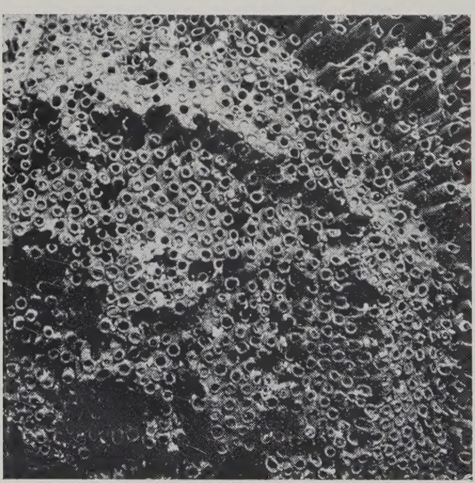

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Constitution of the Palaeontological Society of Japan.

Article 1. The Society shall be known as the Palaeontological Society of Japan. It forms a section of the Geological Society of Japan.

Article 2. The object of the Society is the promotion of palaeontology and related sciences.

Article 3. This Society to execute the scheme outlined under Article 2, shall hold annual meetings and discussions.

Article 4. Proceedings of the Society and articles for publication shall be published through the Journal of the Geological Society of Japan. Separates and circulations will be sent to members of the Palaeontological Society who are not members of the Geological Society of Japan.

Article 5. The annual dues of this Society is two dollars for the foreign members of the Society.

Article 6. This Society shall hold the following executives. President one person, Councillors several persons.

Article 7. The President and Councillors shall be elected annually. The President and Councillors shall be elected from the Society body by vote of its members. All elections shall be ballot.

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